a modulator modulating a light with the adjusted modulation signal, wherein said ~~means~~ adjusts said at least one of the rise time and the fall time in accordance with characteristics of ~~the~~ modulated light as received by a receiver through a transmission path.

REMARKS

I. STATUS OF THE CLAIMS

Claims 9, 10, 21, 30, 34 and 36 are canceled.

In view of the above, it is respectfully submitted that claims 1-8, 11-20, 22-29, 31-33, 35 and 37 are currently pending.

II. REJECTION OF CLAIMS 1-5, 7, 16, 17, 19, 28, 29, 33, 35, 37 UNDER 35 USC 102(B) AS BEING ANTICIPATED BY MARCUSE (USP 5,608,561)

Claim 1 is amended herein to recite the transmitter adjusting at least one of the rise time and fall time **in accordance with characteristics of the signal light at the receiver**. Therefore, generally, claim 1 is amended to include the limitations of claim 9 (which was not included in the rejection). Somewhat similar amendments are made to various of the other independent claims.

Moreover, the comments in Section V, below, of these Remarks, also apply here, where appropriate.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. REJECTION OF CLAIMS 6 AND 18 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER MARCUE IN VIEW OF YAMASHITA (USP 4,723,312) AND DEVENPORT (USP 6,108,119)

The comments in Sections I and V of these Remarks, also apply here, where appropriate.

Claims 6 and 18 specifically recite that both the rising and falling times are **lengthened**. See also claims 11, 27 and 29.

Marcuse discloses that pulse rising and falling times of a transmitted pulse can be reduced, to thereby reduce modulator chirp. Thus, Marcuse specifically relates to reducing modulator chirp which is defined by Marcuse as excess spectral broadening imparted by the

modulator. See, for example, column 6, lines 25-27, of Marcuse.

However, Marcuse simply discloses that rising and falling times can be **reduced**. Marcuse does NOT disclose that rising and/or falling times can be **lengthened**.

In fact, in item 4 on page 3 of the Office Action, the Examiner admits that Marcuse does not specifically teach that a transmitter lengthens both the rise time and the fall time. Instead, the Examiner asserts that such operation would be obvious in view of Marcuse, or obvious in view of Marcuse when combined with either Yamashita or Devenport.

However, Marcuse is specifically directed to reducing modulator chirp. For this purpose, the rise and fall times must be reduced, as described in Marcuse. If the rise time and/or fall time were lengthened, it is respectfully submitted that such operation would increase modulator chirp. Therefore, lengthening the rise time and/or fall time would be contrary to Marcuse. Accordingly, it is respectfully submitted that lengthening the rise time and/or the fall time should not be considered obvious in view of Marcuse, by itself.

Yamashita discloses that the fall time of a long-wavelength LED is generally two to three times longer than the rise time. See, for example, column 1, lines 18-27, of Yamashita. Yamashita reduces the fall time so that it is not so much longer than the rise time. Therefore, Yamashita is related to a totally different objective (reducing the difference in fall time versus rise time) than Marcuse (reducing modulator chirp). Accordingly, it is respectfully submitted that Yamashita is non-analogous to Marcuse, and should not be combined with Marcuse for the purpose of the rejection.

Moreover, Yamashita is related to reducing the fall time. Yamashita does not include any disclosure relating to "lengthening" the fall time.

Therefore, it is respectfully submitted that lengthening the rise time and/or the fall time would not be obvious in view of Marcuse in combination with Yamashita.

Devenport is related to reducing the rise time and fall time of a voltage used to drive an analog programmable power supply used to provide a bias voltage for an optical modulator. See, for example, FIG. 3, and the disclosure in column 5, lines 60-64, of Devenport. Therefore, Devenport is directed to the rise time and fall time for driving a power supply. Devenport is NOT directed to the rise time and fall time of signal light transmitted by an optical modulator. Accordingly, it is respectfully submitted that Devenport is non-analogous art to Marcuse, and should not be combined with Marcuse for the purpose of this rejection.

Therefore, it is respectfully submitted that lengthening the rise time and the fall time would not be obvious in view of Marcuse in combination with Devenport.

In view of the above, it is respectfully submitted that the rejection is overcome.

IV. REJECTION OF CLAIMS 8, 15, 20, 25 AND 32 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER MARCUSE

The comments in Sections I and V of these Remarks, also apply here, where appropriate.

V. REJECTION OF CLAIMS 9-12, 21, 22, 26, 27, 30, 31, 34 AND 36 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER MARCUSE IN VIEW OF YONEYAMA (USP,801,860)

Claim 1 is amended herein to recite the transmitter adjusting at least one of the rise time and fall time **in accordance with characteristics of the signal light at the receiver**. Therefore, generally, claim 1 is amended to include the limitations of claim 9. Somewhat similar amendments are made to various of the other independent claims. Please note that independent claim 26 already includes similar features.

Marcuse discloses that pulse rising and falling times of a transmitted pulse can be reduced, to thereby reduce modulator chirp. Thus, Marcuse specifically relates to reducing modulator chirp which is defined by Marcuse as excess spectral broadening imparted by the modulator. See, for example, column 6, lines 25-27, of Marcuse.

On pages 6 of the Office Action, the Examiner admits that Marcuse does not specifically teach that changes are made in accordance with characteristics of the signal light at a receiver. However, the Examiner asserts that such operation would be obvious in view of Marcuse, or obvious in view of Marcuse in combination with Yoneyama.

In Marcuse, it appears that the rise time and fall time are fixed after being initially set. No portion of Marcuse discloses or suggests that the rise time and fall time are subsequently adjusted after being initially set. Moreover, as Marcuse relates to reducing modulator chirp, Marcuse does not seem so concerned with the signal light as received by a downstream receiver.

Therefore, it is respectfully submitted that the adjusting of the rise time and/or fall time in

accordance with characteristics of the signal light at the receiver would not be obvious in view of Marcuse, by itself.

Yoneyama controls transmitted power levels in accordance with detected power levels at the receiver. More specifically, in Yoneyama, individual wavelengths are multiplexed together into a WDM light, and transmitted through a transmission line. The transmitted WDM light is then demultiplexed into the individual wavelengths, which are received by individual receivers, respectively. See, for example, FIGS. 6 and 7 of Yoneyama.

However, Yoneyama simply controls the transmitted power levels of the individual wavelengths so that the individual wavelengths have the same power levels at the receivers. Yoneyama is not related to controlling the rise time and/or fall time.

Therefore, Yoneyama is related to a totally different objective than Marcuse. Accordingly, it is respectfully submitted that Yoneyama should be considered non-analogous art to Marcuse for the purpose of the rejection.

Moreover, since Marcuse is directed to controlling rise time and fall time, and Yoneyama is directed to controlling power levels, it is respectfully submitted that the combination of Marcuse and Yoneyama would not teach that changes in rise time and/or fall time are made in accordance with characteristics of the signal light at a receiver.

Therefore, it is respectfully submitted that the adjusting of the rise time and/or fall time in accordance with characteristics of the signal light at the receiver should not be considered to be obvious in view of Marcuse in combination with Yoneyama.

In view of the above, it is respectfully submitted that the rejection is overcome.

VI. REJECTION OF CLAIMS 13, 14, 23 AND 24 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER MARCUSE IN VIEW OF CHRAPLYVY (USP 5,420,868)

The comments in Sections I and V of these Remarks, also apply here, where appropriate.

VII. CONCLUSION

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any further fees are required in connection with the filing of this response, please charge such fees to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: April 18, 2002

By: _____
Paul I. Kravetz
Registration No. 35,230

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please CANCEL claims 9, 10, 21, 30, 34 and 36, without prejudice or disclaimer.

Please AMEND the claims as indicated below:

1. (ONCE AMENDED) An apparatus comprising:

an optical transmitter transmitting a signal light to a transmission path; and

a receiver receiving the transmitted signal light through the transmission path, wherein the signal light has a corresponding rise time and fall time and the transmitter adjusts at least one of the rise time and fall time in accordance with characteristics of the signal light at the receiver.

2. (ONCE AMENDED) An apparatus as in claim 1, wherein the optical transmitter comprises:

an adjusting circuit adjusting said at least one of the rise time and fall time in accordance with the characteristics of the signal light at the receiver.

3. (ONCE AMENDED) An apparatus as in claim 1, wherein the optical transmitter comprises:

a light source emitting a light;

a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time;

an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal in accordance with the characteristics of the signal light at the receiver; and

a modulator modulating the emitted light with the adjusted electrical modulation signal, to thereby produce said signal light having at least one of the rise time and fall time of the signal light adjusted.

4. (NOT AMENDED) An apparatus as in claim 1, wherein the transmitter adjusts both the rise time and the fall time.

5. (NOT AMENDED) An apparatus as in claim 2, wherein the adjusting circuit

adjusts both the rise time and the fall time.

6. (NOT AMENDED) An apparatus as in claim 1, wherein the transmitter lengthens both the rise time and the fall time.

7. (NOT AMENDED) An apparatus as in claim 1, wherein the transmitter shortens both the rise time and the fall time.

8. (NOT AMENDED) An apparatus as in claim 1, wherein the transmitter adjusts both the rise time and the fall time to maintain amplitude deterioration and phase margin of the transmitted signal light within a specific range.

9. (CANCELED)

10. (CANCELED)

11. (ONCE AMENDED) An apparatus as in claim 1, [further comprising: a receiver receiving the transmitted signal light through the transmission path,] wherein the transmitter performs one of the group consisting of

lengthening both the rise time and the fall time in accordance with the characteristics of the signal light at the receiver,

shortening both the rise time and the fall time in accordance with the characteristics of the signal light at the receiver, and

adjusting both the rise time and the fall time to maintain amplitude deterioration and phase margin of the transmitted signal light within a specific range in accordance with the characteristics of the signal light at the receiver.

12. (ONCE AMENDED) An apparatus as in claim 1, further comprising:

[a receiver receiving the transmitted signal light through the transmission path; and]

a controller controlling the transmitter to adjust said at least one of the rise time and fall time in accordance with the characteristics of the signal light at the receiver.

13. (NOT AMENDED) An apparatus as in claim 3, wherein the modulator modulates

the emitted light via one of the group consisting of optical phase modulation and optical frequency modulation.

14. (NOT AMENDED) An apparatus as in claim 1, further comprising:

a dispersion compensator compensating for wavelength dispersion characteristics of the transmission path.

15. (NOT AMENDED) An apparatus as in claim 1, further comprising:

a plurality of said optical transmitters, each transmitting a respective signal light having a different wavelength than the signal lights of the other optical transmitters; and

an optical multiplexer multiplexing the signal lights together into a wavelength division multiplexed (WDM) signal which is transmitted through the transmission path.

16. (ONCE AMENDED) An apparatus comprising:

an adjusting circuit adjusting at least one of a rise time and a fall time of an electrical modulation signal; and

a modulator modulating a light with the adjusted electrical modulation signal, wherein the adjusting circuit adjusts said at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through a transmission path.

17. (NOT AMENDED) An apparatus as in claim 16, wherein the adjusting circuit adjusts both the rise time and the fall time.

18. (NOT AMENDED) An apparatus as in claim 16, wherein the adjusting circuit lengthens both the rise time and the fall time.

19. (NOT AMENDED) An apparatus as in claim 16, wherein the adjusting circuit shortens both the rise time and the fall time.

20. (ONCE AMENDED) An apparatus as in claim 16, wherein [the modulated light is transmitted through a transmission path,] the adjusting circuit [adjusting] adjusts both the rise time and the fall time to maintain amplitude deterioration and phase margin of the [transmitted,] modulated light within a specific range.

21. (CANCELED)

22. (ONCE AMENDED) An apparatus as in claim 16, [wherein the modulated light is transmitted through a transmission path, the apparatus] further comprising:

[a receiver receiving the transmitted, modulated light through the transmission path; and]

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with the characteristics of the signal light at the receiver.

23. (NOT AMENDED) An apparatus as in claim 16, wherein the modulator modulates the light via one of the group consisting of optical phase modulation and optical frequency modulation.

24. (ONCE AMENDED) An apparatus as in claim 16, [wherein the modulated light is transmitted through a transmission path, the apparatus] further comprising:

a dispersion compensator compensating for wavelength dispersion characteristics of the transmission path.

25. (NOT AMENDED) An apparatus as in claim 16, wherein the adjusting circuit comprises:

a electrical amplifier amplifying the electrical modulation signal; and

a filter filtering the amplified electrical modulation signal.

26. (NOT AMENDED) An optical communication system comprising:

a transmitter including an adjusting circuit adjusting at least one of a rise time and a fall time of an electrical modulation signal, and a modulator modulating a light with the adjusted electrical modulation signal, the transmitter transmitting the modulated light through a transmission path;

a receiver receiving the transmitted, modulated light through the transmission path; and

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with characteristics of the modulated light at the receiver.

27. (NOT AMENDED) An optical communication system as in claim 26, wherein the controller controls the adjusting circuit to perform one of the group consisting of

lengthening both the rise time and the fall time in accordance with characteristics of the modulated light at the receiver,

shortening both the rise time and the fall time in accordance with characteristics of the modulated light at the receiver, and

adjusting both the rise time and the fall time to maintain amplitude deterioration and phase margin of the modulated light within a specific range in accordance with characteristics of the modulated light at the receiver.

28. (ONCE AMENDED) An apparatus comprising:

an adjusting circuit adjusting at least one of a rise time and a fall time of a modulation signal; and

a modulator modulating a light with the adjusted modulation signal, wherein the adjusting circuit adjusts said at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through a transmission path.

29. (NOT AMENDED) An apparatus as in claim 28, wherein the adjusting circuit performs one of the group consisting of:

adjusting both the rise time and the fall time,

lengthening both the rise time and the fall time, and

shortening both the rise time and the fall time.

30. (CANCELED)

31. (ONCE AMENDED) An apparatus as in claim 28, [wherein the modulated light is transmitted through a transmission path, the apparatus] further comprising:

[a receiver receiving the transmitted, modulated light through the transmission path; and]

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with the characteristics of the [signal] modulated light at the receiver.

32. (NOT AMENDED) An apparatus as in claim 28, wherein the adjusting circuit

comprises:

an amplifier amplifying the modulation signal; and

a filter filtering the amplified modulation signal.

33. (ONCE AMENDED) A method comprising:

adjusting at least one of a rise time and a fall time of a signal light in accordance with characteristics of the signal light as received by a receiver through a transmission path; and

transmitting the adjusted signal light through [a] the transmission path to the receiver.

34. (CANCELED)

35. (ONCE AMENDED) A method comprising:

adjusting at least one of a rise time and a fall time of a modulation signal;

modulating a light with the adjusted modulation signal; [and]

transmitting the modulated light through a transmission path; and

receiving the transmitted, modulated light from the transmission path, wherein said adjusting adjusts said at least one of the rise time and the fall time in accordance with characteristics of the transmitted, modulated light as received by said receiving.

36. (CANCELED)

37. (ONCE AMENDED) An apparatus comprising:

means for adjusting at least one of a rise time and a fall time of a modulation signal; and

a modulator modulating a light with the adjusted modulation signal, wherein said means adjusts said at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through a transmission path.